

# About Technology-Based “Sociology” Software for Knowledge Development: From Questionnaire Creation to Data Processing

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## ABSTRACT

To analyze data sets, sociologists use various methods of mathematical and statistical data processing, which allows comprehensive analysis of the collected social information. A specialized software application is used in sociology. However, there are not many tools for carrying out a sociological research through all its stages. Sociologists often use different software or several software products. However, these programs are quite complex, and therefore their application is possible with special knowledge after a thorough study of the software product or with the involvement of the relevant specialists. Analysis of the possibilities of various programs for creating and processing sociological data shows that their choice is made by researchers on the basis of the ease of learning the program, the convenience of data management, the speed of computation, and graphic capabilities. In 2014, Belashov developed the Russian program for the input and processing of sociological research data “Sociology,” which allows for complete automation of the process of creating sociological data.

## KEYWORDS

Computer Data Processing, Databases, Information Technologies, Sociological Information, Sociological Research, Software, The Program “Sociology”

## INTRODUCTION

Sociological research is facilitated by modern information technologies irregularly, despite the fact that such research requires the use of a wide range of software and hardware (Tsukhai, 2010). Sociological research is a complex activity that is often carried out over a long period of time, in geographically distant places, with the involvement of a large number of specialists, using different methods of data collection and processing (Dayitbegov, Kalmykova & Chapanov, 1994). It requires the use of appropriate software and various automation tools at different stages of research.

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An important requirement for solving sociological problems is to minimize resources to accomplish a certain task. Depending on the nature of the problem, the amount of necessary resources is affected by time and cost restrictions. Compliance with these restrictions can be greatly facilitated by the use of a personal computer at all or some stages of the study. The effectiveness of automation for solving sociological problems can be manifested both in reducing the cost of information processing and in increasing the reliability and reducing the time of information processing. In addition, sociologists collect large amounts of data during research. To work with the collected empirical data, it is necessary to summarize it, to present it in the form of generalized (statistical) indicators that are convenient for further analysis. Methods of mathematical statistics and computer programs for processing sociological data are used for this purpose. The processing of statistical data usually implies using hardware, software and data processing modes that are the same or substantially similar in capacity and variety (Dayitbegov, Kalmykova, & Chapanov, 1994).

Data analysis is a set of actions carried out by the researcher in the process of studying data in order to form a certain understanding of the nature of the described phenomenon. The main purpose of data analysis is to identify or confirm some statistical regularities of interest to the researcher; or, in other words, a certain kind of compression (univariate, multivariate analysis, search for latent variables), averaging the information contained in the data. The statistical analysis reveals some statistical regularities and dependencies that allow the sociologist to make certain generalizations and conclusions. Conducting a full analysis of the primary sociological data requires its processing-bringing to a form convenient for comparisons, generalizations, interpretations.

Sociologists use a large number of different mathematical methods to analyse comprehensively the information collected. Computers with software for mathematical and statistical processing are used in modern sociology for this purpose. Thus, the analysis and processing of sociological data are carried out, as a rule, by means of special programs. These programs are made in the form of software packages. According to the official data of the International Statistical Institute, the number of statistical software products is approaching one thousand. They include professional software packages designed for users who are familiar with the methods of mathematical statistics, and there are packages for specialists who do not have deep mathematical training (Borisova, 2002).

As rightly noted by modern researchers, today there are no universal tools for the implementation of sociological research at all of its stages. Different software (from text processors to statistical packages) and hardware (from cell phones to modern computers) are used at different stages. Therefore, sociologists either have to work with tools that require special knowledge or involve IT experts (Maltseva, Molchanova, & Chernukhina, 2014).

The research plan is developed at the preparatory stage, and it implies a large amount of paperwork. The most common tools used at this stage are various text editors such as Microsoft Office Word, Notepad, etc. They allow you to save and organize all the information collected. There are various opportunities to simplify the process of developing, creating forms, templates of questionnaires. It is also possible to compile a report on the results of the questionnaire, which can be presented in tabular and graphical form. For example, such programs as Microsoft Office InfoPath, Interro-SL, iSpring QuizMaker can be used.

Australian sociologist Adam Zammit created free format queXML6 for questionnaire creation. It allows the researcher to spend less time on the design of the questionnaire and fully concentrate on its content. This approach is particularly useful when using self-completion questionnaires when the researcher is not able to conduct a full briefing with the respondent on the questionnaire. Using the queXML format, the researcher automatically prepares his questionnaire in accordance with modern practices in the field of forms design, thus improving the quality of the answers. QueXML takes into account the type and size of the font, the thickness of the framing lines, the use of “guiding” lines for the respondent, etc. The queXML format is part of the free queX Suite7 package, which also includes a system for scanning and recognizing paper questionnaires, a system for conducting telephone surveys and a system for removing and coding of personal data (Marunich, 2017).

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